

Automotive OTA research: With the arrival of the national mandatory OTA standards, OEMs are accelerating their pace in compliance and full life cycle operations

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The rising OTA installations facilitate rapid adoption of new intelligent technologies such as Al foundation models and NOA in vehicles.

From January to September 2024, 11.083 million passenger cars carried OTA function in China, a year-on-year surge of 37.9%; the installation rate hit 71.7%, up about 17.3 percentage points year on year. With an increasing number of intelligent vehicles, the installation rate of OTA in passenger cars in China is expected to reach more than 90% by 2030.

OTA Installations and Installation Rate in Passenger Cars in China, Jan.-Sept. 2024



Source: ResearchInChina



NOA Layout of Major OEMs via OTA Updates, 2024

With the increase in OTA installations, OTA updates occur frequently. Compared with 2023, OTA updates for vehicles in 2024 become far more frequent. Some OEMs conduct OTA updates monthly with a wider coverage. Moreover, OTA updates in 2024 involve much more intelligent driving functions.

Most OEMs have regarded intelligence as an important selling point of their cars. Thanks to OTA technology, new intelligent technologies from OEMs can be installed into cars faster. For example, many models launched in 2024 enable new intelligent driving functions such as NOA and AEB via OTA updates, and they will continue to be optimized and improved.

NOA Layout of Major OEMs via OTA Updates, 2024

OEM	Jan 2024	Feb 2024	Mar 2024	Apr 2024	May 2024	Jun 2024	Jul 2024	Aug 2024	Sep 2024	Oct 2024
Xpeng		Unlimited XNGP added	XOS 4.6.0 XNGP optimized		XOS 5.1.0 Highway NGP optimized		XOS 5.2.0 Map-free XNGP pushed			
Li Auto	OTA 5.0.2 optimizes highway / urban NOA		OTA 5.1 optimizes highway / urban NOA				OTA 6.0 adds map-free NOA OTA6.1 optimizes NOA	OTA6.2 upgrades highway NOA of AD Pro		
Xiaomi			liti	ď		V1.2.0 adds urban NOA (10 cities) & optimizes highway NOA	OTA 1.2.3 NOA optimized	1.3.0.11 adds the pioneer edition of urban NOA		V1.4.0 activates urban NOA experience
AITO		V3.3.8.9 adds map- free urban NCA	Urban NCA optimized	Urban NCA optimized	archi	nchir	18.00	m	NCA optimized	HUAWEI ADS 3.0 NCA added
NIO	Aspen 3.5.0 / Banyan 2.4.0 optimizes global NOP+						Banyan 2.6.5 optimizes NOP+	Banyan 3.0.0 optimizes NOP+ & Pilot+		

Source: ResearchInChina



OTA updates speed up and hardware OTA updates further improve user experience.

In addition to the ever-increasing range of hardware covered by OTA updates, the hardware, network and other configurations of new models have been improved, and OTA dual-partition technology has been applied. The OTA technical performance of new models also becomes ever better, which is specifically reflected in multiple aspects such as update speed, optional update time, and failsafe in update.

For example, in terms of OTA update speed, multiple OEMs have clearly required faster OTA updates in new architectures or new models.

OTA Update Speed Increase Plans of Major OEMs

Time	-2023	2024	2025~		
Xiaomi Auto		The entire cockpit system can be upgraded in as little as 3 minutes. The entire vehicle can be upgraded in as little as 30 minutes.	• -		
Xpeng	A vehicle update in less than 30 minutes	OTA update is 300% faster.			
Tesla	• •	25 minutes (an intelligent driving and cockpit domain update)			
NIO	90 minutes (an intelligen	nt driving domain update)	Vehicle update is faster. It only takes 30 minutes to update the whole vehicle.		
Changan Automobile	A vehicle control domain	n software update; ≤3min (Deep <mark>a</mark> l)	A user-perceived OTA update takes less than 20 minutes. A user-perceived core controller update takes less than 1 minute.		
SAIC	OTA download and inst	allation takes a few minutes to 2 hours	OTA update is 70% faster. OTA download and installation takes less than 30 minutes.		
FAW Hongqi	A*10*0		A comprehensive update in 3 minutes, 85% faster		
Chery	• •		The update of 3 computing centers takes less than 15 minutes, and the update of 53 controllers takes less than 1 minute. A vehicle OTA update takes less than 30 minutes.		
Dongfeng Voyah	55 minutes (a cockpit ar An IVI system update la	nd intelligent driving domain update) sts 40 minutes.	The IVI operating system update is 20% faster.		

Source: ResearchInChina



www.researchinchina.com

Xiaomi SU7 adopts innovative streaming update technology

Xiaomi SU7, launched on market in 2024, adopts innovative streaming update technology, which can be downloaded and installed at the same time. It can update the whole cockpit system in 3 minutes and the entire car in 30 minutes. OTA dual-zone backup and flashing is not only faster, but also safer and more reliable.

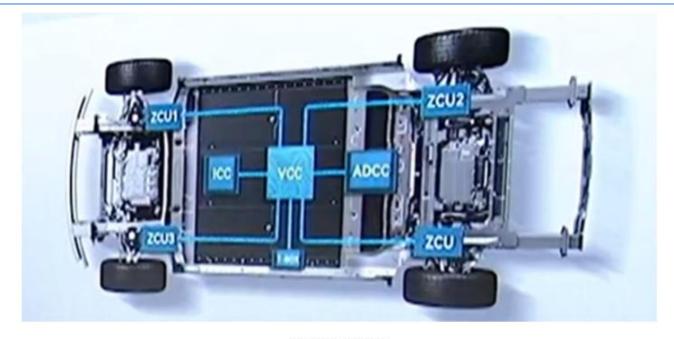


Source: Xiaomi Auto



Chery would join hands with Huawei to build an intelligent base

In October 2024, Chery announced that it would join hands with Huawei to build an intelligent base. The base will adopt the new-generation electrical architecture Mars Architecture, feature Gigabit Ethernet and 1000TOPS computing power, and enable vehicle OTA update within 25 minutes and the one-time success rate of 99.9%.



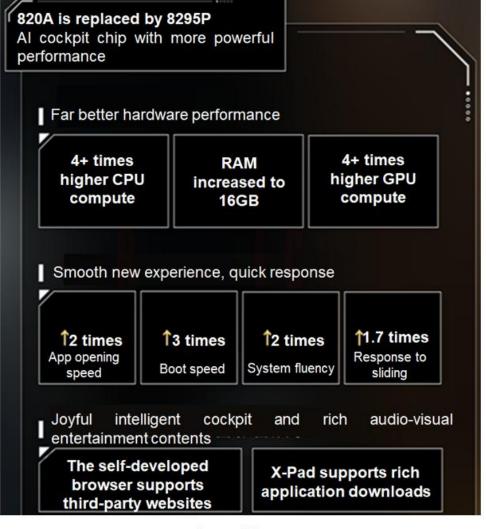
Source: Chery

In addition to the improvement and evolution of software technology, faster OTA updates also require hardware with better parameters, such as higher-compute chips, HPC, shorter wire harnesses, higher bandwidth, and faster communication download speed. Therefore, to improve user experience and OTA updates, some OEMs have proposed hardware update plans for old models.



Xpeng officially launched a crowdfunding campaign for chip renewal for old car owners

In November 2024, Xpeng officially launched a crowdfunding campaign for chip renewal for old car owners. The original car chip Qualcomm 820A was updated to Qualcomm 8295 which is also used in Xpeng P7+ and Xpeng X9, and the RAM was increased from 8G to 16G. The chip upgrade not only improves boot speed and system fluency, but also offers the latest AI Dimensity system to old models such as Xpeng P7 via OTA update.



Source: Xpeng



Regulatory policies and standards are increasingly improving, and there is an urgent need for OTA update compliance.

On August 1, 2024, the Ministry of Industry and Information Technology of China issued the Notice on Further Strengthening the Administration of Access, Recall and Online Software Update of Intelligent Connected Vehicles (Draft for Comments), which aims to further reinforce the management of the access, recall and online software update (OTA) of intelligent connected vehicles equipped with combined driving assistance systems.

The draft suggests strengthening the supervision and administration of OTA updates, and standardizing the application modes and technical parameters of OTA updates. For automotive software update systems, it requires that information such as the name and storage location of electronic control systems that involve OTA, and OTA software version compilation rule files should be sorted out and filed; during OTA update, traceability management of software should be supported.

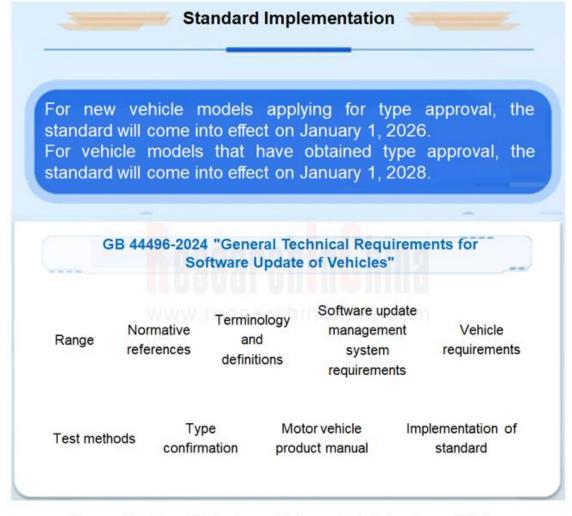
This also means that when the notice is officially implemented, OTA registration supervision will be more perfect and comprehensive, posing new requirements to OEMs and making compliance more important.

On August 23, 2024, the national mandatory standard GB 44496-2024 "General Technical Requirements for Software Update of Vehicles" was officially released. It requires that starting from January 1, 2026, all newly launched models must meet this standard; starting from January 1, 2028, all existing models must also comply with this standard.



Regulations and Standards

In addition to the national standard, multiple regulations and standards such as Software Update Management System (SUMS) required by UN WP.29 R156 and ISO24089 have been also gradually implemented, making OEMs demand OTA technical compliance more urgently. In this regard, automotive OTA suppliers such as ABUP and CAROTA have also stepped up their efforts on OTA update compliance.



Source: Ministry of Industry and Information Technology of China



Layout of Major suppliers in OTA Technical Compliance

Layout of Major Suppliers in OTA Technical Compliance

Supplier	Compliance					
Harman	 Provide comprehensive support for WP.29 OTA and cybersecurity, including the compliance design of OTA solutions and automotive cybersecurity solutions. Provide international regulatory consultation. 					
Airbiquity	■ The OTAmatic Vehicle Configurator allows automakers to know the exact hardware and software configurations within a vehicle, manage known combinations of electronic control units (ECUs) and software versions in vehicles, and meet governments' compliance requirements for systems of vehicles for type approval.					
KPIT	□ WP.29 Cybersecurity Vehicle Regulation Compliance					
ABUP	□ OTA testing and verification capabilities □ OTA compliance services □ A full lifecycle management platform with the global architecture □ A minimal compliance system □ CMMI Level 3 and ASPICE-2					
CAROTA	 □ Focusing on the compliance simulation tests in domestic and foreign OTA-related regulation referring to the Software Update Management System (SUMS), the company has develop OTA life cycle management platform solution with the "supplier-vehicle type-OTA task" as the framework. □ Build a compliance management platform □ OTA software testing, OTA software updates, OTA licenses and subscription services, up remote diagnosis, and security of intelligent connected vehicles 					
Excelfore	 □ Domestic and foreign regulations □ Support for overseas OTA of OEMs. 					
Bosch ETAS	 □ Help OEMs implement "local to global" development plans through regulations, compliance consulting. □ Support OEMs' long-term overseas expansion plans. 					
Desay SV	 □ Provide a full life cycle OTA service system. □ ASPICE CL 3 □ The OTA cloud platform has been certified by National Security Protection Level 3 and ISO information security management system. □ Vehicle OTA solutions in line with ASIL D functional safety 					

Source: ResearchInChina



Table of Content (1)

1 Definition and Policies of Automotive OTA

1.1 Definition and Technology of OTA

Definition of OTA

Classification of Automotive OTA

Basic Architecture of Automotive OTA

Basic Architecture of FOTA

1.2 International OTA Standards and Policies

OTA Regulatory Policies Are Improved

Global Standards and Regulations for Automotive Cybersecurity and Software Updates

Software Update Regulations of the UNECE World Forum for Harmonization of

Vehicle Regulations (WP.29)

UN Regulation 156

Requirements of UN Regulation No. 156 for Automakers

2.1.6 RX Software Identification Number (RXSWIN)

Timeline for the Implementation of UN Regulation No. 156 in Some Countries

ISO Standards for Automotive OTA Updates

ISO Standards for Automotive OTA Updates (1)

ISO Standards for Automotive OTA Updates (2)

EU's Requirements for Automotive OTA

U.S.' Requirements for Automotive OTA

Japan's Requirements for Automotive OTA

OTA Regulatory Strategies

1.3 China's Automotive OTA Standards and Policies

Summary of China's OTA Regulatory Policies and Standards: Policies and

Standards Are Increasingly Improving, and Supervision Is Becoming Stricter

Notice on Further Strengthening the Administration of Access, Recall and Online Software Update of Intelligent Connected Vehicles

Timetable in Mandatory Standard "General Technical Requirements for Software Update of Vehicles"

Interpretation of Mandatory Standard "General Technical Requirements for Software Update of Vehicles"

China's OTA Policies: OTA Recall Supervision

China's OTA Policies: Access Management of Intelligent Connected Vehicle

Manufacturers and Products

China's OTA Policies: Notice on the Filing of OTA Updates of Automotive Software

"Test requirements of Software Update (OTA) Cybersecurity" Was Verified

Guidelines for the Construction of the National Standard System for Internet of Vehicles (Intelligent Connected Vehicles) (2023)

Supervision Policy: Sandbox Supervision

OTA Recalls of Passenger Cars in China, 2021-2024

Summary of OTA Recalls of Passenger Cars in China, 2024

Summary of OTA Recalls of Passenger Cars in the U.S., 2024

2 Status Quo and Technology Trends of Automotive OTA Market

2.1 Status Quo of Chinese Passenger Car OTA Market

OTA Installation in Passenger Cars in China, 2024

OTA Installations and Installation Rate in Passenger Cars in China, 2024 (by

Manufacturer Type)

OTA Installations and Installation Rate in Passenger Cars in China, 2024 (by Model

Price)

TOP15 Passenger Car Brands in China by OTA Installations, 2024

TOP15 Passenger Car Models in China by OTA Installations, 2024

China's Automotive OTA Scale Forecast



Table of Content (2)

2.2 OTA Update History of OEMs

Statistics of OTA Updates by OEMs

Statistics of OTA Updates by Major OEMs: by Brand

Classification of OTA Update Items by Major OEMs

Statistics of OTA Update Items by Major OEMs

Classification of OTA Update Items by Major OEMs: by Brand

OTA Update Frequency of Major OEMs in 2024

2.3 Development and Evolution of OTA Update Technology and Application of OEMs OTA Technology Evolution of OEMs: About 20 OEMs including NIO, Xpeng, Xiaomi, Huawei Harmony Intelligent Mobility Alliance (HIMA), SAIC, etc.

Evolution of OEM OTA Technology

3.2.12 OTA Development Planning of OEMs

- 2.4 Development Trends of OEM OTA (1):
- 2.5 Development Trends of OEM OTA (2):
- 2.6 Development Trends of OEM OTA (3):
- 2.7 Development Trends of OEM OTA (4):
- 2.8 Development Trends of OEM OTA (5):

3 Automotive OTA Layout Trends of Suppliers

3.1 OTA Model Data of Major Suppliers

Model Data of Automotive OTA Suppliers in China, 2023-2024 (1)-(8)

3.2 Summary of OTA Product Layout of Major Suppliers

Automotive OTA Product Layout of Major Suppliers: More Than 10 Companies

Including Harman, ABUP and CAROTA

- 3.3 OTA Product Layout Trends of Suppliers (1):
- 3.4 OTA Product Layout Trends of Suppliers (2):
- 3.5 OTA Product Layout Trends of Suppliers (3):

.

4 OTA Functions and Layout of Major OEMs

4.1 NIO

Development and Evolution of OTA

Technical Features of OTA

Intelligent System Evolution

OTA Update History, 2018-2024

Details of OTA Updates, 2024

OTA Technology and Process

OTA Update Process of ONVO

OTA Security Mechanism

4.2 Xpeng

Development and Evolution of OTA

Automatic and Extremely Fast Vehicle OTA Technology

Automatic Vehicle OTA

OTA Update History, 2019-2024: by Model

Details of OTA Updates, 2024

Intelligent System Evolution: Intelligent Cockpit

Intelligent System Evolution: Intelligent Driving

4.3 Li Auto

Development and Evolution of OTA

Latest OTA Technology Features

OTA Update Requirements

OTA Update History: L Series Models of Li Auto

OTA Update History: Li ONE



Table of Content (3)

OTA Update Plan

Details of OTA Updates, 2024

Details of OTA Updates: OTA Version 4.1-4.6

4.4 Xiaomi Auto

OTA Technology Features: Streaming OTA Update Technology

OTA Update Precautions

OTA Update Process

Details of OTA Updates

Latest OTA Version

4.5 SAIC

Evolution of Passenger Car OTA Technology

Latest OTA Technology

OTA Solution of Z-One

OTA Update History of IM

OTA Update History of Rising Auto

OTA Update History of Roewe and MG-related brands

OTA Update Process of MG

OTA Update Process of Rising Auto

User Feedback Mechanism

OTA Partners

4.6 Geely

Evolution of OTA Technology

ZEEKR's Latest OTA Solution

ZEEKR's Update History

Update History of ZEEKR's Main Models

Update History and Details of ZEEKR 001, 2024

Update History and Details of ZEEKR 007, 2024

Update History and Update Plan of Lynk & Co

Update History of Polestar

Update History of Lotus

Update History of smart

OTA Update History and Details, 2024

OTA Update History and Details, 2018-2023

OTA Update History of GEOMETRY

Fuel Vehicle OTA

2025 Strategy - OTA

4.7 GAC

Development and Evolution of OTA Technology

Latest OTA Technology Features

OTA Update Process

OTA Update History: Hyper

OTA Update History: Aion

OTA Update History: Trumpchi

Latest Cooperation Dynamics

4.8 Changan Automobile

Evolution of OTA Technology

OTA Technology under SDA

Global In-depth OTA

Global Rapid OTA.

OTA Update Process

OTA Update History: Deepal, Nevo, etc.

Update History of Avatr

Update Guide of Avatr: Mobile Phone & Vehicle



Table of Content (4)

4.13 Dongfeng Motor **OTA Layout Planning** Development and Evolution of OTA Latest OTA Technology 4.9 BYD **OTA Update Process** Development and Evolution of OTA **OTA Update Process** OTA of Xuanji Architecture Intelligent layout OTA Update History: Brands Such as Yangwang, Denza, Dynasty, Ocean and Partners and Development Planning Formula Leopard **OTA Update History of Overseas Models** 4.14 Cherv Partners and Development Planning Development and Evolution of OTA Technology Models with OTA and Technical Features of OTA 4.10 BAIC OTA Update History: EXEED, etc. Development and Evolution of OTA Technology Details of OTA Updates, 2024 OTA Update History: ARCFOX, BAIC, etc. Software Business Layout Latest Intelligent Layout 4.15 Huawei Harmony Intelligent Mobility Alliance (HIMA) 4.11 FAW **Evolution of OTA** Development and Evolution of Honggi's OTA Technology **OTA Cloud Services** Hongqi's OTA Technology Model Planning **OTA Update History of Hongqi** OTA Update History of AITO, 2022-2024 **OTA Partners** Details of OTA Updates of AITO, 2024 **OTA Update Process of AITO** 4.12 Great Wall Motor **OTA Update History of LUXEED Evolution of OTA Technology** Details of OTA Updates of LUXEED, 2024 **OTA Technology** Details of OTA Updates of STELATO, 2024 **OTA Update History of WEY OTA Update History of HAVAL** 4.16 Tesla OTA Update History: WEY, Haval, ORA and Tank, etc. Models with OTA and Technical Features of OTA **Development Planning and OTA** Main Steps of OTA Updates Partners and Development Planning



Table of Content (5)

OTA Update History: Number of Updates by Domain OTA Update History and Details in China, 2024 OTA Update History and Details: Before 2023 Model Planning OTA Charging Mode

4.17 GM

Automotive OTA Function Layout OTA Architecture Solution of Buick eConnect OTA Update History: Cadillac, Buick and Chevrolet OTA Development Planning Cooperative ecology

4 18 BMW

Technical Features of OTA
Remote Update Process
OTA Update History and Details
On-demand Subscription Services via OTA
Progress in On-demand Subscription Services
OTA Update Plan

4.19 Mercedes-Benz
Evolution of OTA Technology
OTA Design of STAR 3 Architecture
OTA Update History and Details
OTA Update Requirements
OTA Subscription

4.20 Volvo

Models Supported
Technical Features of OTA
OTA Update Process

OTA Update History and Details

OTA Update Plan, 2025

Key Partners for Software Development

4.21 Ford

OTA Technology: Ford Power Ups

China OTA: Global OTA
OTA Update History: China
OTA Update History: Overseas
Operational Scale of OTA

Partners and OTA Development Planning

4.22 Toyota

Evolution of OTA Technology
OTA Update History in China
OTA Update Process in China
Software Cooperation Dynamics in China
OTA Layout
Software platform layout

4.23 Honda

OTA Partners

Evolution of OTA Technology Technical Features of OTA OTA Update Process OTA Update History: China



Table of Content (6)

OTA Update History: Overseas Latest Intelligent Layout

4.24 Hyundai
Models with OTA and Technical Features of OTA
"Strategy 2030" and OTA Plan
Kia's "Strategy 2030" and OTA Plan
Partners and Dynamics in Cooperation

4.25 Volkswagen
OTA in China
OTA Update Process
OTA Update History of Audi
Software Strategy 2030
Software Iteration Planning
Software Business Team Construction
Software Layout Strategy in China

5 Independent OTA Technology Suppliers

5.1 Harman
OTA Product Evolution
OTA Market
Intelligent Cockpit Product - Ready Upgrade
Architecture of OTA in AWS Cloud
Remote Vehicle Updating Service
Smart Delta for Maps via OTA Updates
Harman Shield
OTA Insight

Brand-new Predictive and Preventive Maintenance (PPM) Solution Cooperation Modes of OTA:

5.2 ABUP

Profile

Automotive Product Line

Automotive OTA Product Line

OTA Solution with SOA

OTA Solution Composition

DOTA Intelligent Cloud Diagnosis

Software Full Life Cycle Operation and Management Solution

Global Deployment Architecture of Software Management System

OTA Charging Mode Customers and Partners

5.3 CAROTA

Profile

OTA Product Evolution

One-stop OTA Solution

One-stop OTA Solution Composition

OTA Software Subscription Service Layout

OTA Compliance Management Platform

Automotive Foundation Model Remote Intelligent Diagnosis Platform

Cooperative ecology

Major customer

5.4 Excelfore

Development History and Strategic Planning

Product Business Layout



Table of Content (7)

OTA Product Evolution

OTA Solution of eSync 2.0

eSync Solution Composition

Remote Diagnosis Services

eSync+eDatX Data Service Platform

OTA Business Dynamics

Major Customers

eSync Alliance

eSync Integrates with Autoware and SOAFEE

5.5 KPIT

Profile

Operation

OTA solution

OTA+Azure

OTA Cases

OTA Dynamics

5.6 Redstone

Profile

OTA Product Evolution

OTA Solution and Latest Features

Application Cases and OTA Business Dynamics

Major customer

5.7 Airbiquity

Profile

Main Projects

OTA Solution: OTAmatic

OTA Solution Composition

Airbiquity Teams up with BlackBerry to Safeguard OTA Updates

Airbiquity Cooperates with Elektrobit to Pre-integrate OTA solutions

Cooperation with Renesas in OTA

Cooperation with NXP in OTA

OTA Business Dynamics

6 Tier1 OTA Technology Suppliers

6.1 PATEO CONNECT+

Basic Internet of Vehicles Business

Qing Cloud

Qing OTA RoadMap

Qing OTA

OTA Dynamics

6.2 Desay SV

Connectivity Services

OTA Solution: Vcare Service Platform

OTA Solution: Vehicle OTA Updates

Autonomous Driving OTA: OTA Business Dynamics

6.3 Thundersoft

ThunderFOTA Solution

Features of OTA Products

Application cases

6.4 Joyson Electronics



Table of Content (8)

Business

OTA solution

Layout and Dynamics

6.5 Banma Information Technology

OTA Dynamics

OTA Update History and Dynamics

Development History

IoV security

6.6 Bosch

OTA Business Layout

Intelligent Transportation Business Division

Bosch Has Consolidated the Development for Its Universal Vehicle Software under

the Umbrella of ETAS

Automotive OTA Business Evolution of Bosch ETAS

OTA Next-gen Solution

Partners and OTA Business Dynamics

6.7 Continental

OTA Layout

OTA Solution: EB cadian Sync

Remote Analysis Solution:

OTA Safety Solution

OTA Is Integrated with EB Corbos

Partners and Dynamics

6.8 FORVIA
OTA Dynamics

CIP Features OTA Updates

OTA Dynamics

Cybersecurity Dynamics

6.9 Aptiv

OTA Business Layout History

The Next-generation Software Architecture and Tool:

Wind River's OTA Solution

Integration of EDGE SYNC and Airbiquity OTA

SVA Supports OTA Updates

OTA Dynamics

6.10 ZF

OTA Solution and Partners

6.11 Denso

OTA Solution and Partners

Software Layout

Vehicle-cloud Integrated Layout

Software Dynamics



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